

NAVY MEDICINE

May-June 1999



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COVER: Casualties of D-Day, 6 June 1944, come aboard LST-357 by sling. Part II of "Tank Deck Hospitals," appears on page 23. Photo by Dale Groom, M.D.

Military Personnel With Hearing Loss and Balance Disorders Have a New Line of Defense

During a military career 1 out of 10 Sailors, Marines, and Soldiers will experience a duty-related temporary or permanent hearing loss or vestibular (balance) disorder that can compromise operational effectiveness. Hazardous noise, a major cause of hearing loss, can usually be traced to damage to the inner ear. Such noise is common in certain military environments such as combat training and real world situations on the battlefield, on ships, or in the air.

A new source of balance disorders is virtual reality technology. This technology is important for navigation, targeting, and training, but when coupled with real motion environments like ships, helicopters, and planes can lead to debilitating vestibular problems. The military spends more than \$1.5 billion annually in compensation, retraining, and equipment replacement due to hearing loss and balance disorders.

An 18-member team of Navy, Army, and civilian researchers and clinicians at the DOD Spatial Orientation Center, Naval Medical Center, San Diego, CA, is making significant advances in treating hearing loss and balance disorders. Preliminary breakthroughs include protection against hearing loss, reversal of sudden deaf-

ness, treatment for Meniere's disease, and restoration of balance function. The results also include a new treatment method, pioneered by the San Diego research team, that delivers medications directly to the inner ear. The inner ear has two organs that perform separate functions, the cochlea for hearing and the semicircular canals for balance.

The ear is made up of three parts—the outer ear, the middle ear, and the inner ear. The outer ear consists of the earflap on the outside of the head and the ear canal. Sound waves are funneled down the ear canal to the eardrum where they are converted into mechanical vibrations by the three bones of the middle ear. The three bones are the malleus (hammer), incus (anvil), and stapes (stirrups). The stapes vibrates a thin, flexible membrane called the oval window and the vibrations are transmitted to the inner ear.

The process of hearing begins when sound, activating hair cells in the inner ear, is converted into neural activity. The snail-shaped structure called the cochlea is the hearing organ. The fluid-filled cochlea contains over 20,000 microscopic hair cells. The vibrations transmitted from the oval

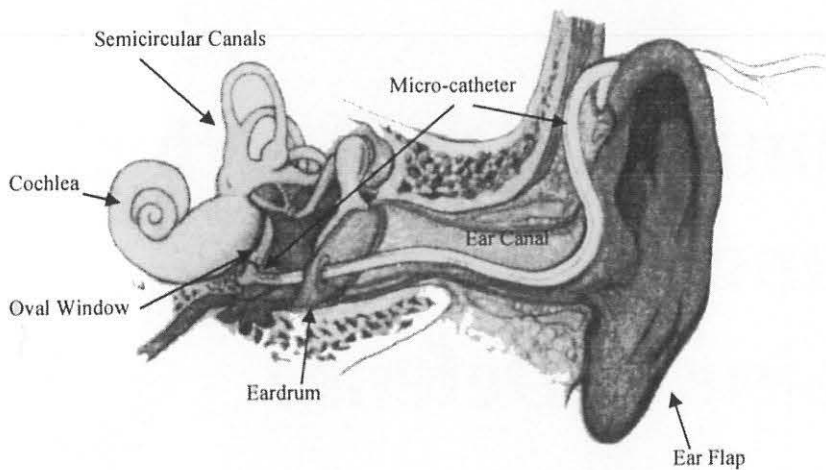
window cause the fluid and the hair cells in the cochlea to move. This movement is converted into nerve signals that travel to the brain.

The balance organ, the semicircular canals, is also located in the inner ear. The fluid-filled canals detect movement in any direction. Tiny hair cells that line the semicircular canals react to the motion of the fluid and generate impulses that eventually reach the brain.

For the past several years team members have been researching the basic science of the molecular structure and function of the inner ear. The two principal investigators, LCDR Michael Hoffer, MC, and LTC(P) Richard Kopke, MC, USA, both otolaryngologists and neurotologists, are key players in the research and clinical advances.

LCDR Hoffer points out, "Understanding the molecular process is the first step toward developing more powerful diagnostic and treatment methods for hearing loss and balance disorders. To treat these disorders, we need to understand how the inner ear is damaged. We need to know the exact mechanisms by which the hair cells, which are responsible for hearing and balance in the inner ear, are

Ear Diagram of Cut Away and Catheter



The technique developed by the research team involves surgically placing one end of a micro-catheter under the eardrum, next to the oval window leading into the inner ear.

damaged by sound, environmental toxins, and drugs.”

LTC Kopke adds, “The thrust of the current and future research is to develop medicines that can make the inner ear more resistant to damage from noise and other toxins. We want to develop medicines that can be given to a patient who has sustained an initial hearing loss or balance disorder that will rescue or reverse the damage to the delicate hair cells in the inner ear. Clinical trials and basic science research are beginning to suggest that damaged hair cells can be repaired and this implies hair cell rescue and recovery.”

The researchers found that when excessive noise or high levels of environmental toxins or drugs interact with the inner ear, the ear’s defenses are overwhelmed and the inner ear actually generates damaging toxic compounds. These toxic compounds, called free radicals, begin to kill hair cells. Nerve endings swell and degenerate within hours of exposure. The major loss of damaged hair cells occurs between 5 and 40 days after exposure.

When hair cells die and nerve endings degenerate the range of hearing those cells detected is lost forever. To restore balance may require physical therapy, surgery, or drugs and the results have not always been successful. The researchers are developing antioxidant drug combinations to counteract the toxic reaction of the inner ear and repair damaged cells.

According to LCDR Hoffer, “Now that we are beginning to see that the damage is oxidative in nature, we are investigating antioxidant strategies to make the inner ear more resistant to damage by noise and other insults and to rescue the inner ear after it has been injured.”

LTC Kopke adds, “From the basic science research, we have identified a number of available drugs that protect and rescue hearing. We are building on our initial success and plan to continue preclinical trials to find out what combinations of medicine are most effective and what potential side effects there may be; in the next year or two we plan more clinical trials.”

One of the most exciting products of the San Diego team’s pioneering research efforts involves the use of a new treatment method that delivers medications directly to the inner ear through a micro-catheter.

The technique involves surgically placing one end of a micro-catheter under the eardrum, next to the semi-permeable oval window. The other end of the catheter comes out of the ear canal and is stabilized behind the earflap with sutures. Antioxidants are delivered in controlled doses to the inner ear for a period of 10-14 days using a mini-pump similar to an insulin pump worn by the patient. The catheter, developed by INTAREAR, Inc. in Denver, CO, has undergone extensive basic testing at Naval Medical Center San Diego, and has been used in patients for over a year.

Hearing has been restored to patients for whom conventional treatments had failed. LTC Kopke said, “We think there is a therapeutic window, when the hearing is down, but permanent damage to the inner ear has not occurred, the hair cells have not died, the neurons have not degenerated. If we can intervene soon after the noise exposure has occurred, we may be able to cause the hair cells to repair themselves or at least limit the damage. It is unlikely that hair cell regeneration is going on with this medication. More likely some repair process is turned on. We think the therapeutic window may be 4 weeks. For example, one patient was treated 2 weeks after initial hearing loss and another patient 3 weeks after initial hearing loss, and both completely recovered.”

These promising results suggest that this type of clinical intervention could be employed to augment currently used mechanical hearing protection to make the inner ear more resistant to noise damage.

A goal of the research team is to augment currently used mechanical hearing protection by developing medicines to make the inner ear more resistant to noise damage. LTC Kopke added, "Marines conduct live fire weapons exercises up to six times a year, and troops use hearing protection. We have been measuring their hearing before and after these exercises and have found that up to 11 percent of Marines, age 18-25, end up with a significant degree of hearing loss due to noise, even with hearing protection in place. During a 3-day small arms and heavy weapons exercise, 71 Army Special Forces troops, wearing double hearing protection, experienced a 23 percent temporary hearing loss and 11 percent experienced some permanent hearing loss."

The research also has resulted in significant accomplishments to resolve balance disorders. Causes of balance disorders from inner ear damage include noise, vibration, toxic fumes, trauma, virtual reality environments, and chemical warfare agents. Approximately 1.3 percent of military personnel is significantly impaired in their ability to perform a combat mission due to treatable balance disorders; this does not include motion sickness. Additionally, there are 40,000 new cases of motion sickness each year. The research team has demonstrated the reversal of toxic vestibular (balance) hair cell damage in the laboratory. Clinicians have devised new strategies for evaluating balance disorders and new techniques for rehabilitating balance disorders and motion sickness.

According to LCDR Hoffer, the team at the DOD Spatial Orientation Center has two novel approaches to treat balance disorders. The first approach uses the micro-catheter system to deliver medicine to the in-

| Hearing Loss Degrades Combat Performance | | |
|---|---------------------|---------------------|
| Word Intelligibility | | |
| | Good hearing | Poor hearing |
| Time to identify target | 40 sec | 90 sec |
| Incorrect command heard by gunner | 1% | 37% |
| Correct target identification | 98% | 68% |
| Enemy targets killed | 94% | 41% |
| Wrong target shot | 0% | 8% |
| Tank crew killed by enemy | 7% | 28% |
| Tank Gunner Performance and Hearing Impairment (Garinther & Peters, Army Res. Development, & Acquisition Bull. 1990, Jan-Feb 1-5) | | |

ner ear to cure Meniere's disease. Meniere's disease is a balance disorder that can affect individuals beginning at the age of 30, approximately 10 years into a military career. The disease causes acute vertigo, dizziness, and hearing loss. Prior to this new method there were only two ways to treat this disease. One was with a medicine that was not always effective and the second was a neurosurgical procedure. Since using the micro-catheter technique, 19 patients have had their symptoms drastically reduced or been cured of the disorder. Nine were active duty personnel on limited duty who have now returned to full

duty. The other 10 were retirees or dependents.

The second approach is the military application of a balance rehabilitation therapy, which has been employed in the civilian sector for 15 years. Patients are taught to retrain their balance system. The DOD Spatial Orientation Center is the only location in the military to provide this therapy.

CAPT Dennis McBride, MSC, the program manager for medical research related to aviation medicine and human performance at the Office of Naval Research (ONR), Washington, DC, points out that the re-

| Incidence of Significant Hearing Sensitivity Decrease of Personnel Onboard 154 Navy Vessels (STS = significant threshold shift*) | |
|--|-----------------------------|
| JOB SPECIALTY/RANK | Incidence of STS (%) |
| Airman apprentice | 70.2 |
| Damage control | 57.0 |
| Sonar Technician | 48.0 |
| Fireman | 40.1 |
| Engineman | 18.0 |
| Hospital Corpsman | 13.1 |
| Officer | 34.0 |
| Enlisted | 24.7 |
| Overall | 29.0 |
| Source: Wolgemuth & Luttrell, Military Medicine, Vol. 160, May 1995, p. 216-222 | |

| Sound Source | Sound Level (Decibels) |
|---|------------------------|
| Mount St. Helens Eruption | 210 |
| Space Shuttle Launch | 190 |
| Missile Launch | 180 |
| Shotgun | 160 |
| Handgun | 150 |
| Air Raid System Firecracker | 140 |
| Jackhammer Machine gun fire at close range | 130 |
| Jet Takeoff Loud Thunder | 120 |
| Rock Concert Power saw | 110 |
| Rivet Gun Subway train in Philadelphia | 100 |
| Lawnmower Niagara Falls | 90 |
| Alarm clock | 80 |
| Noise inside a moving car | 70 |
| Normal Conversation | 60 |
| rainfall | 50 |
| Whisper | 30 |
| Soft rustle of leaves | 10 |

The loudness of a noise depends on the size of the sound pressure wave—the bigger the wave, the louder the noise. Noise is measured and expressed in terms of decibels (dB). OPNAVINST 5100.23B requires that hearing protective devices be worn to reduce noise to a level below 84 dB.

searchers have prevented and reversed inner ear damage. We anticipate this research to continue to evolve to the point where an oral medication is available to the troops.

In the future servicemembers will be able to take a medication prior to or during hazardous noise exposure to prevent hearing loss and balance disorders. The successful implementation of this new treatment has the potential to save the military millions of dollars a year. As an augmentation to established Navy hearing conservation methods, this therapy will significantly improve operational readiness. Existing mechanical hearing protection has some limitations, the level of noise exceeds the limits of the devices, and the devices do not protect against skull vibrations and cannot protect against fume ototoxins.

CDR Andrew Bellenkes, MSC, Force Aviation Human Factors Safety Officer, U.S. Atlantic Fleet, remarked, "Whether on the deck, in the cockpit, or on the battlefield, our Sailors and Marines are daily exposed to potentially damaging noise levels. Despite the use of hearing protection, there still have been some who have suffered inner ear problems. Specialists in safety and health have long searched for a panacea to attrition based on such hazards intrinsic to the working environment, but to little avail. Thus, the treatment developed by CAPT McBride and the San Diego team is an extremely exciting breakthrough, one that now offers hope to many who have suffered from hearing or vestibular problems. This is yet another splendid example of how Navy medicine is working for them—for the fleet." □

—Story by Doris Ryan, Medical Research and Development Division (MED-26), Bureau of Medicine and Surgery, Washington, DC.

Force Health Protection Through Health Promotion Training

R.C. Washburn, CHPD
CDR D.A. McKay, NC, USN

Upon taking office as the Navy Surgeon General on 29 June 1998, VADM Richard A. Nelson, MC, stressed that health promotion would be one of the three main areas of emphasis during his tenure.⁽¹⁾ The others are support for the fleet and Marines and managing the health of our population. This emphasis reflects the reality that a large percentage of all deaths and illnesses in the United States are preventable by positive lifestyle habits, primarily good nutrition, moderate exercise, decreasing alcohol consumption, stress management, and tobacco cessation.⁽²⁾ Accordingly, health promotion is of critical importance to Navy medicine.

The underpinning of the health promotion program in the Navy and Marine Corps began in 1994 with an innovative course to train Navy Health Promotion Directors and Marine Corps Semper Fit Coordinators. The purpose of the course is to develop the skills needed to run creative and dynamic programs that will make healthier Sailors and Marines. This is achieved by a process-oriented course that provides practical knowledge in developing, implementing, and evaluating health promotion programs.

The course highlights the National Goals for Healthy People 2000 and DOD Healthy People 2000 Objectives, and showcases successful Navy and Marine Corps models for health promotion programs. Most importantly, students are given the tools and techniques to develop a solid business plan. The business plan is the umbrella that encompasses strategic areas such as determining customer needs and interests, building program identity, planning and scheduling activities, and evaluating programs. A solidly built business plan is the impetus for support from top-level management. After the week-long course, students have the skills and tools to direct an integrated health promotion program that incorporates the elements outlined in OPNAV Instruction 6100.2 and Marine Corps Order 6200.1A. Additionally, students are required to complete a certification examination within 60 days of course completion.

The course was developed through a partnership between the Navy Environmental Health Center, Norfolk, VA, and the highly prestigious Cooper Institute for Aerobics Research in Dallas, TX. Dr. Kenneth Cooper, one of the best known preven-

tive physicians in the nation and author of 14 books on health and fitness, founded the Cooper Institute.⁽³⁾ The institute's successful techniques for lifestyle changes and improving health are now used by the Navy and Marine Corps to train military and civilian Navy Health Promotion Directors and Marine Corps Semper Fit Coordinators.

The course uses a variety of teaching and team-building techniques. Navy (military and civilian) and Marine Corps instructors augment the Cooper Institute's training staff. One of the course highlights is daily physical fitness training called the "Semper Fit Daily 16" led by a Marine gunnery sergeant trained in health promotion.

Since its inception in 1994, over 700 students have completed the course, yet demand for course quotas remains very high. To support fleet requirements, courses are conducted in Dam Neck, VA; San Diego, CA; Bangor, WA; Pearl Harbor, HI; Mayport, FL; and Yokosuka, Japan. In 1999, additional courses are scheduled for presentation in Camp Lejeune, NC, and Naples, Italy.

Owing to its success, the course is now recognized as the "gold standard" for health promotion training across services. The Army, Air Force, and Coast Guard have also partnered with the Cooper Institute to train their directors.

Force health protection begins with keeping Sailors and Marines healthy through developing positive lifestyles and behaviors that will keep them fit, better able to recover from illness and injury, and to defend our nation if and when called upon.

References

1. *Navy & Marine Corps Medical News* MN-98-26, July 3, 1998.
2. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. U.S. Department of Health and Human Services, Public Health Service. 1990:6-7.
3. Aerobics Revolution: Fitness, Prevention. *U.S. Med.* August 1997;33:9-10. □

Ms. Washburn is a course program manager assigned to the Health Promotion Directorate at the Navy Environmental Health Center, Norfolk, VA. CDR McKay is the Director for Health Promotion and Medical Management at the same facility.

Navy's New Automated Disease Reporting System (NDRS)

CDR R.W. Rendin, MSC, USN
R.C. Morrow, M.D., M.P.H.

Table 1. Medical Event Reports 1997, Combined, Navy & Marine Corps Case Frequencies among Active Duty

| Disease | TOTAL | USN | USMC | Disease | TOTAL | USN | USMC |
|-----------------------|-------|-----|------|--------------------|-------|-----|------|
| Amebiasis | 1 | 1 | 0 | Measles | 0 | 0 | 0 |
| Anthrax | 0 | 0 | 0 | Meningitis (viral) | 43 | 21 | 8 |
| Bites, Non-venomous | 103 | 53 | 47 | Meningococcal | 1 | 0 | 0 |
| rabies vax given | | | | Disease | 5 | 5 | 0 |
| Bites, Venomous | 9 | 3 | 5 | Mumps | 0 | 0 | 0 |
| Botulism | 0 | 0 | 0 | Onchocerciasis | 0 | 0 | 0 |
| Brucellosis | 0 | 0 | 0 | Paratyphoid Fever | 0 | 0 | 0 |
| Campylobacter | 1 | 1 | 0 | Pertussis | 0 | 0 | 0 |
| Chancroid | 6 | 4 | 2 | Plague | 0 | 0 | 0 |
| Chlamydia* | 464 | 231 | 222 | Polioyelitis | 0 | 0 | 0 |
| Coccidiomycosis | 1 | 0 | 1 | Psittacosis | 0 | 0 | 1 |
| Cryptosporidiosis | 0 | 0 | 0 | Q Fever | 0 | 0 | 0 |
| Dengue Fever | 1 | 1 | 0 | Rabies Human | 0 | 0 | 0 |
| Diphtheria | 0 | 0 | 0 | Relapsing Fever | 0 | 0 | 0 |
| E. coli 157 Infection | 3 | 0 | 2 | Rheumatic Fever | 1 | 1 | 0 |
| Encephalitis | 6 | 4 | 1 | Rift Valley Fever | 0 | 0 | 0 |
| Ehrlichiosis | 0 | 0 | 0 | RMSF | 7 | 0 | 7 |
| Filariasis | 0 | 0 | 0 | Rubella | 2 | 0 | 0 |
| Giardiasis | 24 | 21 | 2 | Salmonellosis | 25 | 17 | 9 |
| Gullian-Barre | | | 0 | Schistosomiasis | 0 | 0 | 0 |
| Syndrome | 1 | 1 | | Shigellosis | 11 | 9 | 2 |
| Hantavirus Inf. | 0 | 0 | 0 | Smallpox | 0 | 0 | 0 |
| Hepatitis A | 24 | 21 | 3 | Syphilis (all | 46 | 29 | 10 |
| Hepatitis B | 14 | 9 | 4 | stages) | | | |
| Hepatitis C | 3 | 3 | 0 | Tetanus | 0 | 0 | 0 |
| Influenza (Outbreak | | | | Toxic Shock | 3 | 3 | 0 |
| only) | 0 | 0 | 0 | Syndrome | | | |
| Lassa Fever | 0 | 0 | 0 | Toxoplasmosis | 0 | 0 | 0 |
| Legionellosis | 1 | 1 | 0 | Trichinosis | 0 | 0 | 0 |
| Leishmaniasis (all) | 0 | 2 | 0 | Trypanosomiasis | 1 | 0 | 0 |
| Leprosy (Hansen's | | | | Tuberculosis | 10 | 6 | 1 |
| Disease) | 1 | 0 | 0 | (Pulm) | | | |
| Leptospirosis | 1 | 1 | 5 | Tularemia | 0 | 0 | 0 |
| Listeriosis | 0 | 0 | 0 | Typhoid Fever | 0 | 0 | 0 |
| Lyme Disease | 16 | 9 | 8 | Typhus (all) | 0 | 0 | 0 |
| Lymphogranuloma | | | | Varicella | 20 | 15 | 4* |
| Venereum | 27 | 3 | 8 | Yellow Fever | 0 | 0 | 0 |
| Malaria (all types) | 13 | 6 | 24 | | | | |

* reportable as of
October, 1997

Surveillance of disease refers to the continuing scrutiny of all aspects of the occurrence and distribution of disease necessary for effective control and prevention. In a time of worldwide concern about emerging and reemerging infectious diseases, the Bureau of Medicine and Surgery, Washington, DC, deployed the Naval Disease Reporting System (NDRS) to improve surveillance through a new system for reporting communicable diseases and other medical events.

This new reporting program and electronic communication system was developed at the Navy Environmental Health Center (NEHC), Norfolk, VA, and is designed with the deckplate Sailor in mind. It makes disease reporting easier, faster, and more accurate.

Modeled after a Microsoft Access-based program used by the Air Force, and with the assistance of COL R. Williams, USAF, BSC, NDRS was designed by Navy preventive medicine technicians, epidemiologists, and environmental health officers.

Available for downloading through the NEHC Internet web site <http://www-nehc.med.navy.mil>, NDRS requires a 386-processor or greater running Windows with a minimum of 8 megabytes of RAM. It has a distinctly Navy feel with fleet-oriented fields, numerous pull-down menus, disease information, and automatic features. It eliminates much of the variation and labor required when submitting the previously required "Disease Alert Reports."

Figure 1 represents the entry screen for malaria (type falciparum) as it would appear when a case is being reported. This screen provides access by mouse click to the case definition (as applied by all three Armed Ser-

Microsoft Access

File Edit View Records Window Help

Medical Event Report

Personal Data - Privacy Act of 1974 Reporting UIC: 68546

FMP: 20 Sponsor's SSAN: 123-45-6789 Name: PATENT, MALARIOUS Case Def

Service: Navy Status: Active Duty Rate: P-43 Paygrade: E4 Print

DOB: 12/31/50 Sex: Male Race: White Ethnicity: Non-Hispanic Delete

Diagnosis: MALARIA, FALCIPARUM 854.0 Other (ICD)

Date of Report: 5/15/98 Date Of Onset: 5/1/98

Final Report: No Confirmed: No

Report to NEPMU: 2, NORFOLK VA

Presumed Locale of Infection

City: Esmeraldas City State: Esmeraldas Country: Ecuador

Contact Info Patient Disposition Comments Close

Form View FLTR

Figure 1

Selected Disease Rates, USN

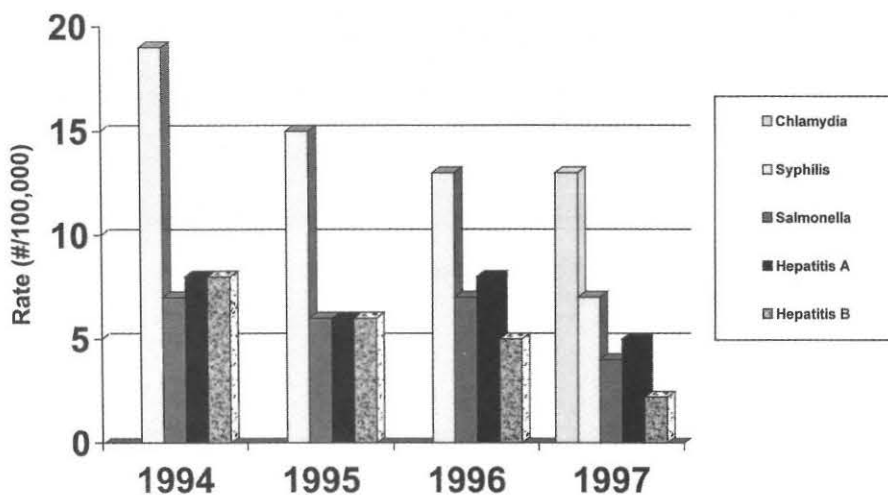


Figure 2

vices and based on Centers for Disease Control (CDC) definitions), ready fields for clinical description, place of infection, type of preventive measures taken or not taken, complications, diagnostic tests, and amount of time lost from duty. For special diseases, such as tuberculosis or sexually transmitted diseases, there are screens to help in

contact tracing. Demographic and other information are automatically transferred from screen to screen. Once the report is complete, it is automatically encrypted to ensure privacy, encoded, and transmitted via the Internet to the nearest Navy Environmental and Preventive Medicine Unit (NEPMU).

The first significant product of the system is the creation of the data base of reportable disease for 1997, reflected in Table 1.

As part of the DOD Global Emerging Infectious Disease Surveillance and Response System, NDRS will improve disease prevention and intervention actions by more accurate and timely disease trend analyses by Navy epidemiologists. For example, Figure 2 reflects the 4-year trend of certain infectious diseases. While there has been a decline in the rate of syphilis, it becomes clear that the significant challenge is in the treatment and prevention of chlamydial infections. Chlamydia was added to the reportable disease list in October 1997. It was the most frequently reported infectious disease of that year.

Disease reporting and analysis are just two legs of the surveillance triad. The third is dissemination. The products of NDRS along with other relevant articles are contained in another new Navy product, the *Naval Medical Surveillance Report* (NMSR). The first edition of this report was released in February 1998. Each edition is posted on the NEHC homepage as well as being sent out to every MTF, ship, and other operational commands.

With this new surveillance system, reports, analysis, and dissemination of information, Navy medicine is better prepared to maintain the combat readiness of its Sailors and Marines through disease prevention. As such, NDRS and NMSR are tangible examples of the concept behind NEHC's motto "Think Populations, See Individuals."

CDR Rendin is Director for Preventive Medicine at the Navy Environmental Health Center, Norfolk, VA. Dr. Morrow is an epidemiologist, Preventive Medicine Directorate at the same facility.



Charette Health Care Center, Naval Medical Center Portsmouth, VA

Navy Medical Facilities Update

James R. Brassfield

Change is the order of the day and coping with that change can be difficult. But fear not, facilities are being improved throughout the claimancy and if you go to some of the following locations you'll witness the improvements.

The big project under way is, of course, at Portsmouth, VA. One million square feet of new hospital

was recently occupied. Levels one and two have been equipped and the rest of the facility was accepted from the contractor in October 1998. Occupancy became reality in April 1999.

Also in the Portsmouth area is a new clinic at NWSGA Chesapeake, a much-needed facility which replaced old modular shacks.



Medical/Dental Clinic, Naval Station Everett, WA

The base realignment and closure program gave us several facilities. At Pensacola the new medical and dental clinic at the technical training school accommodates students who moved down from Memphis. Three clinics were justified at RTC Great Lakes due to the closures of NTC San Diego and NTC Orlando. Two of these facilities are now operational and the third, a dental expansion, is under renovation. Also at Great Lakes there is a normal MILCON project under design to add laboratory space to the "A" school. This project has been approved by Congress.

The nuclear power training school move from Orlando justified new and expanded clinics at NWS Charleston, which are now complete.

NAS JAX now has a new Aviation Survival Training Center because of the Cecil Field closure, and Joint Reserve Base Fort Worth enjoys a new medical and dental clinic following the closure of NAS Dallas.

Finally, the Marine Corps move from El Toro to Miramar has cemented the need for a new medical clinic which is under construction at the new renamed MCAS Miramar. Dental will expand into the vacated area of the original clinic as the final phase.

Things are taking shape elsewhere in the Marine Corps. MCAS Yuma received a new clinic addition which is now occupied and the old clinic was renovated. Edson

range at Camp Pendleton has a brand new medical clinic for active duty and dependents who reside in the area. And two new troop clinics are under design for San Mateo and Margarita areas. Also, we have in a future MILCON program two more similar troop clinics for Las Flores and Horno areas.

The mission of preventive medicine personnel should be made easier in the future as two new additions have been added to their laboratories at San Diego and Norfolk. Also, a new Environmental Health and Industrial Hygiene Lab was built of modular construction in record time and is now in use at Camp Pendleton.

In the northeast, although many bases have closed, we enjoy a new outpatient facility at Newport. Moreover, this new building is attached to the old outpatient department which, itself, is receiving a renovation this year. A lot of square footage will be returned to the station after this project is completed, saving maintenance and repair funds we can spend elsewhere.

Also in New England the Naval Undersea Medical Institute is receiving a major rehabilitation of its existing building. This facility is to provide training capability for undersea medical officers and support staff.

On the west coast a replacement hospital for NAS Lemoore is under construction. This 150,000-square-foot



Outpatient Clinic Addition/Alteration, Naval Hospital Pensacola, FL

facility is mostly outpatient oriented but does include 15 beds, mostly for OB and pediatrics, a sign of the times. This new building will provide much more space in a functional layout compared to the original hospital and will be in an earthquake-proof facility. In the northwest a new clinic is ready for construction at NAVSTA Everett, WA, a homeporting base for one of our carriers.

Across the sound a new addition is being advertised for construction to add much-needed outpatient space to

Naval Hospital Bremerton. Finally, at Bangor, WA, a new Disease Vector Ecology and Control Center will be built at the SUBBASE to accommodate the function currently occupying space in a leased building in Poulsbo.

Down south a major addition for the Pensacola hospital is under design and has been approved by Congress as part of the FY99 bill. This will give Pensacola much more clinical area and rehabilitate a lot of space in the old building. NAS JAX will also receive an addition to



Medical/Dental Clinic, Key West, FL



Comprehensive Health Care Clinic, Quantico, VA

its medical and dental clinic which will relieve congestion there.

At Key West a new clinic is half built. This project is a sharing initiative with the Veterans Administration, which will pay for and occupy a wing at the rear of the new facility. This building has been designed in the flavor of Key West, and you can almost picture Ernest Hemingway taking it all in from the front porch.

The Naval Operational Medical Institute is receiving an addition to its building at Pensacola to provide more aviation exam space next to the existing building.

Finally, at Quantico, a 100,000-square-foot medical and dental clinic was awarded for construction in August 1998. This facility will provide new and much more functional clinical area for the Marines and their beneficiaries in a central location near the headquarters area of the base. The old hospital on the Potomac River will be returned to the Marines for administrative use following completion of the new clinic in the spring of 2000.

In Italy things are popping. You've probably heard the rumors of improved living conditions in Naples. The rumors are based on fact. A new complex had been completed at Capodichino where the operational Navy works, and it includes a new medical and dental facility which opened on 3 Aug 1998.

A Flight Line clinic is under design for NAS Sigonella which has been approved by Congress for construction in FY99.

We are finally under way with the replacement Naples hospital project at a new support site north of the City of Naples. This is a lease/construct project at the moment with the option for a MILCON buy-out in the future. It will

be a 170,000-square-foot replacement hospital and dental clinic including 20 beds and lots of outpatient space. It will also have an MRI, something we haven't seen in Naples to date.

Renovation projects have now been completed at La Madellena, providing a totally rehabilitated medical clinic and a newly renovated dental clinic in a building a block away.

A few countries away in Bahrain, a new medical and dental facility is nearing completion in a secure area of the expanded base with other new QOL facilities scattered around it.

As a last thought, the Japanese government indicated that a replacement for the Okinawa hospital would be in place by the year 2008. Let's hope they accelerate their plans as their economy improves. In the meantime we will continue to spend maintenance and repair money on the existing hospital to keep it in shape.

With all the reorganization, the downsizing, and the explorations through TRICARE, keep in mind that new facilities are under way all over the world and will be available to all beneficiaries when they are needed. We in MED-33 hope you enjoy them. □

Mr. Brassfield is the Chief Architect and Deputy Director, Facilities Division (MED-33), Bureau of Medicine and Surgery, Washington, DC. He has been involved in medical facilities work since 1970. Except for Naples and Okinawa, all significant Navy medical and dental facilities have either been replaced or received a major rehabilitation during his tenure.

Naval Health Services Doctrine for Logistics and Patient Movement

LT Maurice Morales, MSC, USNR
LCDR Mitchell Reading, MSC, USN
CAPT Edward P. Wyatt, MSC, USN

Third in a Series

It has been about a decade since the disintegration of the Soviet bloc. Although the possibility of global war is remote, U.S. military forces continue to face persistent threats from diverse adversaries around the world. Often, these threats to national security are not immediately recognized as such. But the instability that might result from a natural disaster, famine, or infectious epidemic can be just as threatening as that from terrorism, civil war, or Iraq's naked aggression in the invasion of Kuwait in 1990.

In this new environment, U.S. military forces must be prepared to engage in conflicts on the scale of Operation Desert Storm while still responding to regional crises such as those in Somalia, Bosnia, and Haiti. In

order to meet these threats more effectively, U.S. military forces have begun a transformation that emphasizes information superiority and smaller, lighter, more flexible and more mobile units. For Navy and Marine Forces, the application of these new concepts will focus on expeditionary warfare in the littoral regions of the world.(1)

Over the past 2 years, Navy medicine has been reengineering itself to better support the new readiness-related missions outlined in *Forward From the Sea*, *Operational Maneuver from the Sea*, and *Joint Vision 2010*. In our last article, we discussed Naval Force Health Protection, the overarching concept that is the foundation for this new approach to health service support.(2) In this article, we will describe how two important health

service components, logistics and patient movement, are evolving to meet the needs of the warfighter of the 21st century.

Update

Before we continue, we would like to report on the progress made in the development of the Navy's new health service support doctrine publications. Table 1 lists the title and status of each of the publications in the health service support library. Under the direction of the new Navy Warfare Development Command (NWDC) in Newport, RI, the Naval Health Services Doctrine Working Group is facilitating the development of these publications.(3) Their authors are as diverse as the Navy Medical Department itself. Input is being provided by members in the

fleet, Marine Forces, CONUS and OCONUS organizations, active and reserve components, Medical Corps, Dental Corps, Nurse Corps, Medical Service Corps, headquarters staff and "operators." As the table indicates, at the time of this writing all the publications were at the first or second draft stage.(4) Despite the complex and extensive coordination process mandated by NWDC, all of the publications are still on track and should be completed by the end of fiscal year 1999.

Concept and Principles of Health Service Support Logistics

Health service support (HSS) logistics encompasses the procurement, initial issue, receiving, storing, management, resupply, and disposition of health care supplies and equipment necessary to implement the principles of Force Health Protection (FHP). As Figure 1 illustrates, these tenets include a healthy and fit force, casualty prevention, and casualty care and management.

A comprehensive, efficient, responsive and reliable HSS logistics system is vital to the success of FHP. This system must be able to function in a joint environment, afloat and ashore, in all scenarios from military-operations-other-than-war (MOOTW) to regional contingencies and major the-

ater wars (MTW). The HSS logistics system manages health care materiel movement to such diverse "customers" as medical and dental treatment facilities, amphibious casualty receiving and treatment ships, Marine Expeditionary Forces, T-AH 19 *Mercy*-class hospital ships, and fleet hospitals.

The HSS logistics system is responsible for two classes of supplies, known as Class VIII A and B. Class VIII A refers to medical and dental supplies and equipment. It includes consumables such as bandages and drugs, as well as surgical instruments, and major and minor pieces of equipment. Safety, sterility, and reliability standards are important considerations for this class of items. In addition, controlled drugs, as defined in the National Narcotics Act, are subject to intensive security and control processes to preclude theft and unauthorized use.

Class VIII B refers to human blood and blood products. These fluids are the most valuable for use in patient care and include frozen as well as liquid blood and red blood cells. Class VIII B also includes Ringer's lactate, human albumin, fresh frozen plasma, and platelet concentrate. Safety, sterility, and temperature management are important objectives in the movement and storage of this class of sup-

plies. Specialized training is required to properly deglycerolize frozen blood and blood products.

Class VIII supplies are organized into Authorized Medical Allowance Lists (AMALs) and Authorized Dental Allowance Lists (ADALs). These constitute the authorized allowances of equipment and consumables required to support the mission of all operational platforms. Shore establishments do not have standard allowance lists due to the wide variety of specialized medical care that they provide.

With few exceptions, the logistic support of naval forces in wartime will be the same as in peacetime. Class VIII A materiel is requisitioned through established channels via military standard requisitioning and issue procedures (MILSTRIP). Class VIII B materiel is distributed by the Navy Blood Program, which in turn is overseen by the Armed Services Blood Program Office (ASBPO). ASBPO is chartered by the Department of Defense (DOD) to provide this Class VIII B materiel to the services to meet medical requirements during national emergencies and overseas military operations.

Just as concepts like *Operational Maneuver From The Sea (OMFTS)* are transforming expeditionary warfare, business practice reengineering

Table 1. NWP 4-02 Series Publications

| NWP | Title | Status |
|--------|---|--------------|
| 4-02 | Naval Force Health Protection | First Draft |
| 4-02.1 | Health Service Support Logistics | Second Draft |
| 4-02.2 | Patient Movement | First Draft |
| 4-02.3 | Health Service Support for Military Operations Other Than War | First Draft |
| 4-02.4 | Fleet Hospitals | Second Draft |
| 4-02.5 | USMC Health Service Support Operations | Published |
| 4-02.6 | Hospital Ship Health Service Support Operations | First Draft |
| 4-02.7 | Combat Stress Control | First Draft |

initiatives are transforming traditional HSS logistics to conform to the tenets of Focused Logistics described in *JV 2010*. The Medical Prime Vendor Program, a cooperative venture between the Defense Logistics Agency and private industry, provides a consolidated source of supply for brand-specific items. This program shortens the logistics pipeline and makes it more reliable. As the program is extended to the fleet, naval operational units will have direct electronic ordering access to over 2,500 medical/surgical items. The program ensures more rapid delivery and guarantees a 1-year shelf life on products.

Vendor Managed Inventory (VMI) is another logistics initiative designed to ensure readiness. Inventory is purchased by the armed forces and held by vendors for rotational purposes. VMI contracts specify the quantity, geographic location, and time frame for the "just in time" delivery of medical materiel. Thus, deployable medical platforms are able to rotate their stock and minimize replenishment costs.

The ultimate goal of this transformation of HSS logistics is a sea-based system. Sea-based logistics will provide the means to support littoral power projection from over the horizon, independent of sovereign restrictions and overseas basing requirements. In a sea-based amphibious operation, for example, the logistics support capabilities of the landing force are retained on board ships of the task force and all supply support, including medical and dental, is provided to troop elements directly from the ships as needed. As in other aspects of *OMFTS*, information superiority, integrated communications, flexibility, and mobility will be required to implement this concept successfully.

Concept and Principles of Patient Movement

While HSS logistics supports the entire spectrum of FHP, the patient movement system focuses primarily on casualty care and management. The goal of the patient movement system is to minimize the effects of

wounds, injuries, and disease by moving patients from the point of injury or illness as rapidly as possible to the appropriate level of care in the HSS system.

Patient movement comprises two basic functions: medical regulating and patient evacuation. Medical regulating is the process that identifies the most appropriate destination medical treatment facility (MTF) for the patient being evacuated. Patient evacuation is the actual process of transporting any person who is wounded, injured, or ill to and/or between MTFs.

Successful patient movement requires in-depth planning, adequate resourcing and skillful execution. It also depends on key considerations such as the evacuation policy; an integrated command, control, communications and computer system; aeromedical evacuation (AE) assets; and high-quality medical care during patient transit (en-route care), and at each node or level of the HSS system.

The theater evacuation policy establishes the maximum period that patients may be held within the theater for treatment. Patients who, in the opinion of responsible medical officers, cannot be returned to duty status within the prescribed period are evacuated by the first available means, provided the travel involved will not aggravate their medical condition.

The evacuation policy is set by the Secretary of Defense upon the recommendation of the Commander in Chief (CINC) of the applicable unified command. In general, a shorter evacuation policy results in a requirement for fewer hospital beds in theater and more beds out of theater. It will also result in a greater demand for intertheater patient evacuation resources. Conversely, a longer evacu-

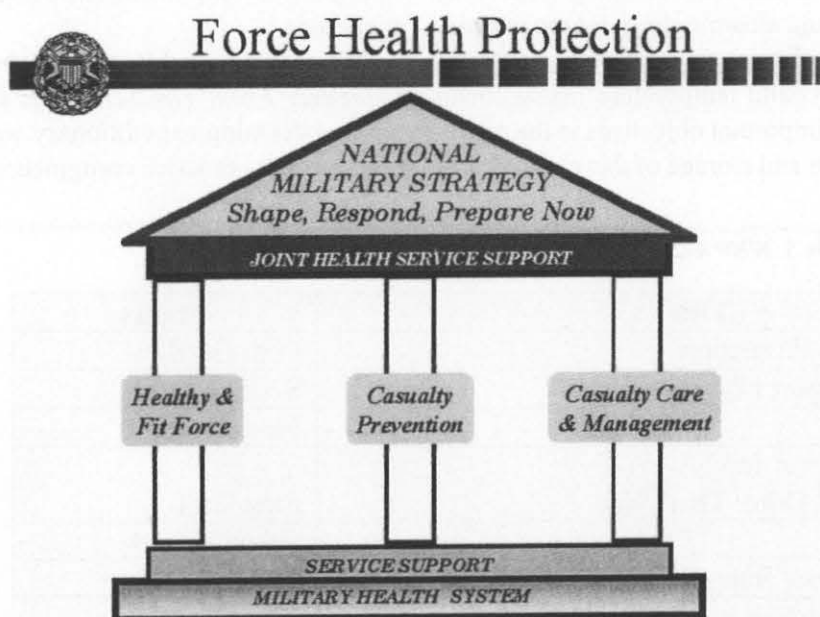


Figure 1. Concept of Force Health Protection

ation policy results in a requirement for a larger HSS system in theater and fewer hospital beds outside the theater. It also increases the requirements for HSS materiel and maintenance, as well as nonmedical logistic support.

The theater evacuation policy is not inflexible; it can be adjusted by the CINC as needed. Coordinating patient movement from the site of injury in a distant theater through the various levels of care and back to CONUS is a complex process that may involve multiple organizations on a service and joint level.

The Global Patient Movement Requirements Center (GPMRC) is a joint organization reporting directly to the Commander in Chief, U.S. Transportation Command (TRANSCOM). GPMRC provides medical regulating services, including clinical validation, patient in-transit visibility, and evacuation requirements planning for inter- and intratheater aeromedical evacuation (AE). GPMRC coordinates at the theater level with Theater Patient Movement Requirements Centers (TPMRCs) to integrate and resolve difficulties with plans and schedules. These efforts are supported by dedicated information systems.

The Defense Medical Regulating Information System (DMRIS) is currently used for medical regulating. It will soon be replaced by the more advanced TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES), an automated decision support tool that can be used in peacetime and contingencies. TRAC2ES is designed to provide total patient visibility from theater and during transit. It will also track transportation assets and available hospital beds by specialty.(5)

Aeromedical evacuation assets are another key consideration in patient movement. These include not only the

fixed and rotary wing transportation assets but patient movement items and supplies, as well. For expeditionary warfare, naval forces currently rely on CH-46 and CH-53 helicopters. They will soon have access to the MV-22 Osprey tilt-rotor aircraft. This platform can be configured to carry 12 patient litters or 24 ambulatory evacuees. In joint operations, naval forces will continue to rely on Army and Air Force (and in some cases multinational) AE assets for some intra- and intertheater patient movement requirements.

The quality of care is always an important consideration in HSS, but as expeditionary warfare evolves under *OMFTS* it will become an even more important aspect of patient movement. Battle casualties will be handled using rapid stabilization, far-forward resuscitative surgery, essential care and hospitalization in theater, and rapid evacuation out of theater to more definitive levels of care as defined by theater evacuation policies. To conserve the fighting strength of the force and restore the health of as many sick and injured personnel as possible, the patient movement system must perfect en-route care and total in-transit visibility of casualties.(6)

Conclusion

As naval forces turn their attention to the emerging threat of "chaos in the littorals" HSS is also evolving to meet new challenges. The transformation of HSS logistics and patient movement parallels that of the warfighter's tactics and techniques. Neither combat forces nor their service support elements will be able to rely on a large logistics base ashore as they historically have in conventional amphibious operations.

In future conflicts envisioned by *OMFTS*, smaller, lighter, and more widely dispersed forces will turn over-

whelming tempo and momentum to their advantage. HSS logistics and patient movement systems must be adjusted to provide the right product or service at the right time and in the right place. The requirement for rapid casualty evacuation will stress the entire spectrum of the patient movement system. For both HSS logistics and patient movement, the key enabler will be information technology and integrated communications. Guiding the employment of these new systems will be the doctrine that is being written today as NWP 4-02.1 and NWP 4-02.2.

References

1. As defined in *Operational Maneuver From The Sea*, the littorals are those areas characterized by great cities, well-populated coasts, and the intersection of trade routes where land and sea meet.
2. Morales M, Cocrane R, Wyatt EP. *Naval Force Health Protection: doctrine for the 21st century*. *Nav Med*. January-February 1999.
3. Additional information on the Naval health services doctrine Working Group may be obtained from their web site, which is linked to the BUMED Homepage (www.nmimc-web1.med.navy.mil/bumed). In the left-hand border, click on the link titled "Readiness Reengineering."
4. NWP 4-02.5 USMC Health Service Support Operations was originally developed as Marine Corps Warfare Publication (MCWP) 4-11.1 by the Marine Corps Combat Development Command, Quantico, VA.
5. Chairman, Joint Chiefs of Staff. *Joint Publication 4-02.2 Joint Tactics, Techniques, and Procedures for Patient Movement in Joint Operations*. December 1996.
6. Concepts Division, Marine Corps Combat Development Command. *United States Marine Corps Warfighting Concepts for the 21st Century*. January 1996. □

LT Maurice Morales, MSC, USNR, is the Reserve Liaison Officer in the Medical Resources, Plans and Policy Division of the Office of the Chief of Naval Operations (OPNAV N931). LCDR Mitchell Reading, MSC, is Head, Fleet Support Office at the Naval Medical Logistics Command. CAPT Edward Wyatt, MSC, is Head, Plans and Policy Branch in the Medical Resources, Plans and Policy Division.



Tobacco Cessation During Under Way Deployments

CDR Paula Pendrick, NC, USN

Many individuals look toward a 6-month seagoing deployment as an opportunity to accomplish many things. Possibly they are motivated to perform that job they have been training so hard to learn or to earn their warfare qualifications. Some look forward to the foreign exercises and port calls while others strive to make use of all available off-duty time for self-reflection and improvement. This self-improvement

could consist of taking PACE (Program for Afloat College Education) courses, an exercise plan to tone-up or lose weight, and even to stop tobacco use.

Deployments, for some individuals, can be a great time to stop tobacco use. Some ships are making it more and more inconvenient to smoke. Most ships do not allow smoking or dip use in the berthing, eating, and workspaces, forcing individuals to walk to the closest

smoking area. Other ships have busy flight decks or have aircraft utilizing night vision goggles which limit outside smoking areas. These inconveniences joined with a desire to quit, an available tobacco cessation program, and a supportive command may be all that is necessary for a tobacco user to give up the habit.

Having just completed two seagoing deployments, ARG 96-1 aboard USS *Guam* (LPH-9) and ARG 97-2



Opposite page: CH-46s land aboard USS Kearsarge (LHD-3). Left: Crewmember lights up on an outside gallery deck.

aboard USS *Kearsarge* (LHD-3), I had the opportunity to provide tobacco cessation programs aboard each ship. These two grossly different deployments allowed me to make some interesting observations while facilitating tobacco cessation programs. This information may be helpful for those facilitators preparing to provide such a program aboard their own ship.

Backed by the claim of the Surgeon General of the United States that smoking was the single most important preventable cause of death in our society, it was the ship medical department's objective to create an environment that supported abstinence and discouraged the use of tobacco products. My objective as facilitator was to provide tobacco users the encouragement and professional assistance to stop smoking or dip use.

The tobacco cessation program used was the American Cancer Society's "Fresh start Plus" approach. This west coast taught program, is a 6-week-long, one session per week course designed to help participants stop smoking or chewing tobacco.

The first 2-week sessions helped prepare the individual to quit while the last four sessions, assisted them in controlling urges, stress, and the physical changes that would occur with withdrawal. It provided essential information and strategies needed to direct their efforts toward tobacco cessation. Based on information given in the tobacco use profiles, most individuals were placed on 1-week of 21 mg, 1 week of 14 mg, and 2 weeks of 7 mg nicotine patches before going "cold turkey." Of course, this schedule was groomed based on their individual daily tobacco consumption.

Initially, ship's crewmembers sought me on an individual basis to request help. Later, announcements made in the Plan of the Day (POD), at morning musters, and formations generated exceptional interest. Most importantly, all the medical and dental officers aboard the ship: ship's crew, Fleet Surgical Team, Marine Expeditionary Unit (MEU), Battalion (BLT), and Air Combat Element (ACE) physicians were alerted to the availability of the program and screened their

patients for potential quitters. They reviewed risk factor sheets and performed medical evaluations on individuals with concerning health conditions prior to their beginning the program. Based on tobacco use information and the facilitator's recommendations, they also wrote prescriptions for nicotine patches.

Prior to deploying the American Cancer Society provided many free publications. The ship's reproduction shop duplicated the screening forms, copies of the course book, and handouts. This information is not protected by copyright laws and the American Cancer Society encourages duplication. Other duplications were limited once under way due to the few copying machines on board and their frequent casualty rate. Course books handed out each week were returned and reused in later classes.

Early in the deployments I presented the material one-on-one with the tobacco user and found they really appreciated the individual attention. I was also able to accommodate meetings with these individuals around my regular patient care load. With increased involvement, small classes of one facilitator to six students were used. Then later, classes as large as 15 were gathered.

Aboard Guam, no formal classes were announced initially due to the limited availability of patches. Nicotine gum was used after nicotine transdermal patches had been exhausted. Sailors and Marines so desperate to quit or to stay off cigarettes came to the classes to learn and reinforce their new smoke-free life without the luxury of patches. Others tried

the gum which was found to be fairly successful in assisting dip/chew users to stop tobacco use, but not as successful for smokers. Later on, once patches became available in the base Navy Exchanges, individuals bought their own patches and attended the classes.

By month two of Guam's deployment I was receiving numerous requests for a formal class with nicotine patches. Thirty-four people came for-

ward. Because of the large expense in procuring patches (approximately \$51 per person for a 4-week supply) a formal request to order more patches was submitted through the chain of command. Utilizing money from the captain's discretionary fund, patches were ordered and the second session of the program commenced.

Of special note, prior to the program's commencement, the ship's Safety Officer registered some objec-

tions. He felt that giving up nicotine would be too stressful to the crewmembers, affecting their performance and safety. Off the coast of Liberia at this time, the ship was far south of normal supply lines and experiencing a lack of dip tobacco. It was argued that this tobacco cessation program was no more stressful than going cold turkey which the dippers were now enduring. The program started as planned.

On board *Kearsarge*, initial investigation into the ship's procurement of nicotine patches and gum led to both the Medical Administrator and ship's Supply Officer stating that the ship did not have the funds to support this effort. Preparing for a 6-month deployment, the Authorized Medical Allotment List (AMAL) pharmaceuticals and supplies had top priority. After the new fiscal year, however, money was allotted for health promotions and procurement of patches for the next year was initiated.

Facing a lack of resources did not deter us. Local land-based clinics were solicited, came to our aid, and kept our program afloat. During workups for ARG 97-2, 19 people came forward with interest in starting the program. Plans were made through the Health Promotion Department at (Sewells Point) Branch Medical Clinic, Norfolk, VA, to screen and provide patches for crewmembers, based on an understanding that patches were to be used with my shipboard tobacco cessation program. Due to our premature departure from Norfolk for operational needs off the coast of Zaire, only seven individuals were able to visit the clinic and attain their patches.

The first tobacco cessation program was presented over the first 6-week period of our deployment with four of seven individuals successfully completing the program and abstaining from nicotine until the end of the



LCAC entering well deck of *Kearsarge*



COMPHIBRON 4 Amphibious Ready Group (front to back): USS *Kearsarge* (LHD-3), USS *Carter Hall* (LSD-50), and USS *Ponce* (LPD-15)

deployment. This program was held during a 2-month under way period in which there were few distractions or breaks in routine. In retrospect, this uninterrupted seagoing time appeared to be best for providing this program. There were few distractions and classes were easy to attend. In addition, starting the classes early in the cruise allowed tobacco cessation to begin before seagoing tobacco use habits were firmly imbedded in an individuals daily routine.

While off the coast of West Africa during the first 2 months of the float, many Sailors and Marines came forward expressing their desire to begin the tobacco cessation program. Having heard good reports from the initial class participants, they were interested in attaining the patch or gum for themselves. Requests for help were sent out to commanding officers of all three U.S. Naval Hospitals in the Eu-

ropean Theater. Naval Hospitals Naples, Italy; Sigonella, Italy; and Rota, Spain, all promptly responded.

Each naval hospital provided assistance in their own way with regards to health promotion. Rota provided nutrition and weight-reduction classes to the Sailors and Marines aboard *Kearsarge*. Sigonella sent 12 sets of patches and 2 boxes of Nicorette gum and Naples was by far the most helpful with 32 sets of nicotine patches.

Based on these positive replies, word was passed to the Sailors and Marines aboard *Kearsarge* to come forward for screening if they were interested in tobacco cessation. On our voyage to the Mediterranean from the coast of Western Africa, screening was conducted on 74 individuals. This screening consisted of completion of a Physical Assessment Risk Factor Sheet, blood pressure checks, tobacco use profile, and a SF 600.

Again, medical officers aboard ship were able to screen particular individuals that had identified risk factors on their screening forms.

Within a week of leaving Naples, the first in the series of tobacco cessation classes began. Enough patches were received for the first 44 individuals to register to begin the class. The sessions continued with 19 successfully completing the program. This number, added to the first 4, gave a total of 23 successful "quitters" out of a possible 52. Two weeks prior to returning to Norfolk, each participant was contacted to identify those still off tobacco. This survey conducted late in the 6-month deployment reflected 23 successes out of 52 participants and is the basis for our statistics.

In retrospect, I have identified some helpful hints for those presenting their own ship-based tobacco cessation program.

| | USS <i>Guam</i> LPH-9 Stats as of 18 June 1996 | USS <i>Kearsarge</i> LHD-3 Stats as of 3 Oct 1997 |
|--|---|--|
| Number enrolled in tobacco cessation classes | 38 | 52 |
| Number of successful ex-tobacco users | 11 | 22 |
| Marines | 12 (1 success) | 34 (14 successes) |
| Navy | 26 (10 successes) | 18 (8 successes) |
| Success rate | 29% | 44% |

1. The American Cancer Society in your local area can provide access to some videos and numerous pamphlets (free of charge) concerning the hazards of cigarettes and smokeless tobacco.

2. The American Cancer Society also provides Smoking Cessation Facilitator Training.

3. Packets of information and all the screening forms may be reproduced by the ship's print shop. Re-use information packets when possible to spare copier parts and paper.

4. Seek assistance from the local Navy-based Health Promotion or Wellness Center. They may be able to give you advice or assistance in starting up your own ship-based program.

5. Groom an interested individual or a second Tobacco Cessation Facilitator to assist you in your class presentations, BP screenings, paperwork, and facilitation. If your primary job could pull you off the ship suddenly (for instance, escorting a critical patient), make sure a replacement is available so that your absence won't leave your class participants without any direction.

6. Keep humor in your classes. This helps to calm the stress the individuals are going through and makes classes more interesting. Start a class with a joke if you have one.

7. When possible, encourage buddies to go through the class together or as part of a work center. Before getting under way, assist interested spouses to enroll in local tobacco cessation programs so that they can have an opportunity to give up tobacco too.

8. Don't make it too easy for the individuals to get patches or gum. Allow the 2 weeks of preparation classes to screen out those people not yet ready to quit. These 2 weeks give an individual time to reflect about giving up a substance they have grown to need. In the long run, this weeding out process saves time and money from a lot of "false starts."

9. Avoid presenting the tobacco cessation program during a major exercise or operation. Often there is not time or attention for the individuals to participate. If possible, plan the 6-week course between the planned operations and exercises.

10. Due to busy schedules, offer each class at least 2-3 times per week, early and late in the day to include those people working unusual shifts, duties, working parties, or on special land-based exercises. Make your classes convenient to attend.

11. For those people working nights, individually groom their plan and the use of patches around their sleep habits. Patches have been known to cause violent and vivid dreams, so make sure they're applying their patches at the beginning of their work day.

12. Liberty ports, though a distraction to a program, do not hinder people from stopping their tobacco use. It's usually the alcohol ingested in a liberty port that decreases their inhibitions and increase their chances of tobacco use again. Make a liberty port a learning experience, prepare them for the event, and allow them to work through it. It is a small dose of what they face when they get back to America.

13. Have the ship's pharmacy distribute all patches on a weekly basis after receiving a legally signed prescription. If an individual receives 3 weeks worth of patches at one time, they may not come back to the classes.

14. Don't be afraid to ask for help in attaining patches and forms. All commands care about health promotions and will do their utmost to assist when possible. □

When this article was written CDR Pendrick was a critical care nurse assigned to Fleet Surgical Team EIGHT, based at Little Creek Amphibious Base, Norfolk, VA.

Rocket Science for Sailors: A Spanking New Approach to Preventive Health

LT Fred Cardwell, MSC, USN

The U.S. Centers for Disease Control and Prevention estimate that foodborne illnesses cost the United States up to \$22 billion a year (that's \$22 with *nine* zeroes!). Closer to home, in 1997 the Navy/Marine Corps reported 145 cases of illness confirmed from pathogens commonly transmitted through food and/or water. Consider how these pathogens might impact operational readiness: Disease is no respecter of persons, points out Frederick Cartwright in his book *Disease and History*. William the Conqueror died from a ruptured ulcer in the large bowel, a late result of typhoid fever; King John probably died from the same cause although his end is romantically attributed to a surfeit of peaches and new cider. English soldiers at the battle of Crecy in 1346 were so riddled with dysentery that the French called them the breechless or bare-bottomed army.

A *Food Safety Manual* has recently been written to replace Chapter One, "Food Service Sanitation," in the *Manual of Naval Preventive Medicine*.

The new manual, written by Navy Environmental Health Officers, Navy Supply Corps, Army Veterinary professionals, and a host of others, was based on the 1997 recommendations of the U.S. Public Health Service Food and Drug Administration, *Food Code*. The *Food Code* provides "the latest and best scientifically based" food safety advice we can offer those responsible for regulating Navy/Marine Corps food.

The manuscript was sent to the Bureau of Medicine and Surgery for signature in March 1998.

In adopting *Food Code* model requirements for safeguarding public health and ensuring that food is unadulterated and honestly presented when offered to the customer, Navy food managers are, in reality, adopting the Hazard Analysis Critical Control Point (HACCP) system.

NASA developed the HACCP system to provide manned space flights with food safety principles. In one respect, HACCP is very much like that class you took in college or high school where there was no clear-cut

answer (philosophy?). HACCP is all about creativity. All you need to remember are seven basic principles (steps):

Hazard Analysis

- Identify the Critical Control Points (CCP) in food preparation.
- Establish Critical Limits for preventive measures.
- Establish procedures to monitor CCP.
- Establish the corrective action(s) to be taken when monitoring shows that a Critical Limit threshold has been exceeded.
- Establish effective record keeping systems to document the HACCP system
- Establish procedures to verify that the HACCP system is working (*Food Code*).

That's all there is to it. There is no set method to accomplish each procedure. Do it any way you like. JUST DO IT! For more details on HACCP, see the new *Food Safety Manual*, which may be downloaded from www.nehc.med.navy.mil.

Change is never easy. For most food service personnel, HACCP conjures nightmarish images of endless paperwork and fruitless sanitation practices. Among regulatory personnel, HACCP represents monitoring regulations impossible to enforce. While it's easy to understand these biases, they are baseless.

Stripped down to its essentials, HACCP is about just one thing: food safety. Successful HACCP implementation will require teamwork from an HACCP-oriented organization. To create a truly HACCP-oriented organization, the Navy/Marine Corps food team will require Top Management Support and Training.

Top Management Support is essential because food establishment managers are not likely to develop a strong HACCP orientation until Navy/Marine Corps food safety and environmental health directors believe in it, want it, and support it.

Training is essential because food establishment employees have direct contact with food and customers. Navy/Marine Corps food establishments are being encouraged to implement a practical approach to the HACCP system in their daily operations. Future food safety inspections will also be based on HACCP.

No longer will food establishments receive a "sanitation score." Instead of focusing only on basic sanitation, inspectors will examine the practices, preparation, and procedures used in production to prevent and/or eliminate food hazards. In the future, food establishment managers will develop, implement, and maintain the HACCP system. Navy medicine food safety experts will review these HACCP plans to assure that critical control points are identified, critical limits are properly set, and monitoring is performed.

Change is never easy. Since all parties will be affected differently by HACCP and all have different issues, unanimous acceptance of HACCP is not expected for some time.

Change is never easy but it is crucial for the Navy/Marine Corps food teams to initiate a food safety system designed to reduce risk to operational readiness from foodborne illness, improve food quality, reduce waste, and lower production costs.

HACCP is a wonderful new approach to preventive health that costs little and offers high yields. But it will require some changes, as we all know.

Bibliography

- Cartwright FF. In collaboration: Biddiss MD. *Disease and History*. New York, NY: Crowell Co; 1972.
- Food Code*, 1997 Recommendations of the United States Public Health Service Food and Drug Administration; 1997.
- Naval Medical Surveillance Report (NMSR)*. 1998;1(3). □

LT Cardwell is assigned to the Navy Environmental Health Center, Norfolk, VA.

FOXY-29 and Tank Deck Hospitals

The Medical Role of LSTs in the Invasion of Normandy

Dale Groom, M.D.

Part II

In the last issue the author recalled his wartime initiation into the Navy as a physician, his assignment to an LST, and the hazardous voyage to Britain through U-boat-infested waters. When he arrived, preparations for the invasion were well under way.

With May drawing to a close, life became a bit more earnest. First, there was the matter of an inspection. For reasons unknown, the 357 had been chosen as the LST to receive and be inspected by "certain high officials," and we were given only 5 days to prepare. For such a battle-scarred old relic of previous invasions, that was no small job. Immediately all hands turned out to scrub and paint, obscuring as best they could shrapnel holes in bulkheads and

what other battle scars remained. There was the stowing of gear and tidying up quarters so she would look like one huge showcase. Shoes received their "spit and polish," haircuts were the order of the day, uniforms had their last-minute creases. Finally the big day came—May 25th—when we piped aboard no less than the British monarch, His Majesty King George VI, replete with retinue of palace guards and admirals, all bedecked with a splendor of medals and ribbons.

Quickly any semblance of pomp and circumstance was abandoned as the King and his company toured our spiffy ship, walking up and down ladders, looking into almost every nook and cranny (except possibly the heads?). H.M. surprised more than a few sailors along the way, greeting them in his unassuming and amiable way. He didn't make a speech, only a

few words of welcome and thanks on behalf of his countrymen for our contribution to the common cause of victory. But I guess kings don't make speeches. At any rate, King George VI saw our good ship at her slickest best. And we were proud of her.

Speculation was rife that the royal visit to the 357, of all the ships in that harbor, just might be an omen. Then by word-of-mouth came the word that we, not those shiny newer LSTs, would be assigned a leading role in what was to come. This was because of our "experience." (Could the word really be *expendable*?) One need not have been clairvoyant to sense the significance of the acceleration and direction of activities surrounding us.

Increasingly, preparations were evident everywhere. Heavily laden trucks choked roads into the south coast restricted area. War materials were piled high on both sides. Throngs

After D-Day: Corpsmen wearing Red Cross armbands look over a mixed load of casualties, Americans and German POWs. The LCT's crewman (top) is about to tie up to LST-357, ramp to ramp, so litters can be carried directly aboard.

of Soldiers, mostly American and British army, milled about drilling or just having a last fling ashore. There was no attempt at secrecy as records of our ship and all its personnel were collected for safe storage ashore. We received fresh medical supplies, some obviously perishable such as blood. Sailors brought stocks of stretchers aboard. Nazi radio broadcasts continued to taunt us with threats that D-Day meant "Death, Destruction and Defeat." They assured us that our loved ones back home had bid us good-bye for the last time, that wives and sweethearts were living it up in our absence, and there were the lurid descriptions of "castrating mines" buried in the sand.

No question remained that the time for action was imminent when hundreds of U.S. Army First Division Soldiers came aboard to sleep in their trucks. On deck, they ate their Spam, K-rations, and C-rations. Still, we heard nightly bombers overhead and, having glimpsed the devastation in cities such as Plymouth and Exeter as well as what we could see there in Weymouth's harbor, we knew well their significance.

Tensions mounted. Ships were sealed; no one was allowed to go ashore or come aboard other than a chaplain who gave "complete absolution" to Catholics and solace to most others, suggesting that there really are "no atheists in foxholes."

For nearly all of us though, the long weeks of anxious waiting had become quite intolerable. We were ready to have it out, no matter what. Those ringing words of Churchill as

he rallied his people and the free world must have rallied us as they took on a new and personal meaning: "We shall not flag nor fail. We will fight on to the end. We will fight on the beaches, in the fields and in the streets. We will never surrender!" Certainly those words should have buoyed up any flagging spirits, including ours.

Shortly after midnight on June 4th, some 4,000 ships and vessels of many types began to move from England's ports all along the south coast in precisely timed order. There could be no question now: This was it. Invasion at last. We would really cross that Channel. We hoped we had round-trip tickets.

A stiff breeze from the west whipped up whitecaps while a drizzling rain limited visibility, all foretelling worse weather ahead. About dawn, however, the entire convoy turned west, back to Weymouth. The Navy is not noted for providing explanations in such circumstances, but the assumption was that the rough seas and persistent rain foretold worse weather ahead.

Again the next night the same procedure. So D-Day would be June 6th, not June 5th, as originally planned. This time, after only a few hours following east along the coast, we actually turned south.

The skipper unsealed his well-guarded book of official orders containing amazing strip photos of beaches and fortifications both in and beyond the water's edge, a veritable treasury of intelligence and a triumph of security. Had its secrecy been breached

anywhere along the lines of preparation or delivery, the greatest military gamble of the war might well have been lost, another tragic Dunkirk in the making.

At last we knew where we were going. It would be across a 100-mile-long stretch of English Channel, not a route to the east toward Dover where marathoners can and do swim across to the French coast. Our assigned section, designated "Omaha Beach," lay in the vicinity of St. Laurent, Vierville, and Colleville of the Normandy coast. A second American beach to be known as "Utah" would be some 20 miles to the west on the peninsula of Cherbourg, facing Saint Mere Eglise and Montebourg. The "Gold," "Juno," and "Sword" beaches of Canadian and British forces lay 20-30 miles east of Omaha, in the region of Bayeux and Caen.

At sea, our front line consisted of a row of minesweepers towing their long cables that fanned out in an overlapping arrangement to ensure a safe path for us to follow, marking that path with two continuous lines of buoys that resembled the flats of golf courses, showing tiny lights at night. Along each side of our column ranged a row of escort vessels: destroyers, corvettes, PT boats, subchasers, and other craft, mostly British.

Aboard we also carried a war correspondent, a novelist who had deliberately chosen to go in on a lead ship to "see it all" and photograph documentary films of the action. Sharing my cabin was a rather dignified Army doctor. He, unfortunately, had been summarily ordered to a beach battal-



A more expeditious way to load patients than the over-the-side slings of D-Day: An LCT "married" to the bow ramp.



ion from duty in an Army hospital in Ireland. (What could a professor of obstetrics from Johns Hopkins University possibly accomplish that might not as well have been done by an able first aid recruit?) I never heard from him after he went in with one of the first waves, but found in my cabin his typewriter, which he had bequeathed to me. Later, I employed it to type notes eventually used for this account.

June 5th was a long day. All the secret charts, maps, and operational instructions had been opened and studied so the whole Allied plan of invasion was evident. We knew a surprising amount about the enemy's defenses: the arrays of spiked and forbidding barriers on the beach—tank traps, the heavily fortified valleys through the cliffs, the underwater entanglements, and even the type of sand on which

landings would have to be made. We also estimated the number of planes the enemy could put up to meet us. We knew so much, in fact, that one felt uneasy wondering how much the enemy must certainly know about us.

But why weren't his submarines and E-boats coming forth? And what of those long-range guns we knew were buried behind the cliffs to blow us out of the sea. When would they open up? We could identify some of our planes flying overhead, unchallenged by the famed Luftwaffe. By now we were well into their half of the Channel so any turning back would be a retreat. The die was cast, for sure.

The very uncertainty heightened our concern. Could we have been lured into a gigantic trap that would snap shut and devour our armada with, as the Nazi radio had threatened, "Death, Destruction and Defeat?"

Night came on and still no action, only the slow roll of the ship and the drone of engines at half speed. Few of us slept that night. Orders had gone out that Army assault troops would be allowed to sleep in our own ship's quarters this night. Furthermore, they would be sent off to those bunks with the best our galley could provide—steak dinners. It was the Navy men who stayed up at General Quarters, alert for attacks that never came.

If you happened to have the job of censoring mail, you knew that many prayers went up in the early morning hours of June 6th, that some of the men took out their St. Christopher medals, or lucky coins, or perhaps a rabbit's foot, while others were just itching to get in there for a real good fight. Maybe a few, very few, just didn't give a damn.



About midnight, LST-357 was the second ship to arrive at what was designated as the "Transport Area," a long line drawn on charts perhaps 2 or 3 miles offshore, along which all ships would anchor in a particular order to unload. All our Navy personnel, who had been at General Quarters alert to any action which never came, now had ringside seats for a truly spectacular bombing of the coastline by the air armadas of Allied planes that had promised thousands of sorties. On our right was the battleship *Texas* (BB-35), on the left the cruiser *Augusta* (CA-31), both using their big guns to lob shells ashore directed, we understood, by paratroopers landed behind the lines to radio positions of targets identified by grids. As far as one could see, this Bay of Seine was ablaze in color flares marking various sectors of what was destined to be that notorious Omaha Beach.

The bombardment continued on through the night until one wondered how any living thing could survive on that beach. Antiaircraft fire sprayed up toward our bombers in diminishing force; twice we saw it send a plane down in flames. With the first streaks of dawn we could see from our vantage point the beaches and cliffs and always those guns of the *Texas* firing with thunderous impact we could feel as well as hear.

We spotted a few paratroopers in the distant sky and saw planes towing gliders to be cut loose to land in sites behind German lines. Still we remained

unscathed, observers of the prelude to massive invasion.

Dawn came with a splendor that one might regard as a good omen, for superstition can take a new hold on you as life becomes more precarious. For many, this would be the last sunrise they would ever see. This thought must have crossed the minds of more than a few. Keeping busy helped; joining others in the intensive preparations for action could yield welcome distraction from impending uncertainties and fears.

Our Rhino had to be loaded with men and vehicles. Assault troops, commandos, demolition squads, and medical units were put aboard our LCVs, about 30 men in each of the four, all lowered away into the water. DUKWS (amphibious trucks) were driven out our open bow ramp into a choppy sea, a few of them foundering, abandoned by their crews. We could see literally scores of such craft circling their ships impatiently awaiting the signal to head in toward the beach, which would be their battlefield.

At 6:05 a.m., the aerial bombardment ceased. Only those huge guns of the *Texas* and *Augusta* continued hurling their shells at targets farther inland. Still no Luftwaffe dive-bombing our ships and, so far as we were aware, no vessel had been attacked in the Channel crossing thus far.

(Conclusion in the July-August issue)

Dr. Groom resides in Jacksonville, FL.



The author (left) with LST-357's skipper, LT James J. MacLeod, USNR

Evaluation of Naval Aviation Candidates With a History of Kawasaki Disease

LT Karen M. Le Hew, MC, USN

Kawasaki disease (mucocutaneous lymph node syndrome) is manifested as an acute febrile illness occurring in children primarily under the age of eight. It is characterized by persistent high fever, conjunctival injection, mucosal changes in the oropharynx, changes in the peripheral extremities, erythematous rash, and cervically lymphadenopathy.⁽¹⁾ Originally thought to be a benign illness, we now know that up to 30 percent of those affected will develop some cardiovascular involvement. Coronary aneurysms and dilatation are evident in at least 20 percent of patients.⁽¹⁾

Kawasaki disease (KD), first observed in Japan in 1967, is now distributed worldwide, and occurs in all ethnic groups. In the period from 1976 to 1985, the Centers for Disease Control (CDC), reported 2,126 confirmed cases of KD in the United States, an average of 220 cases per year.⁽¹⁾

Initially, patients were treated with aspirin for its anti-inflammatory actions, but in the early 1970's, it became apparent that approximately 1-2 percent of patients were dying suddenly, just as they appeared to be recovering from the illness. In almost all cases, the cause of death was related to massive myocardial infarction from coronary artery thromboses.⁽¹⁾ Autopsy results showed the causes of mortality to be a spectrum of disease ranging from coronary ectasia to aneurysm formation, thrombosis, and myocardial infarction.

In studies during the 1980's, researchers in Japan noted the effects of high-dose intravenous immune globulin (IVIG) on the cardiac complications of KD. Researchers here in the United States then compared the effects of high-dose IVIG plus aspirin with that of aspirin alone in reducing the frequency of coronary artery abnormalities.⁽²⁾ The researchers found significant reductions on both initial

echo (23.1 percent vs. 8.0 percent), and on followup echo (17.7 percent vs. 3.8 percent) and thus determined that children receiving IVIG were one-third as likely to develop coronary abnormalities.

The standard protocol today includes administration of aspirin at 100 mg per kg per day administered every 6 hours for 14 days, and high-dose IVIG at 400 mg per kg per day over 2 hours on 4 consecutive days. Convalescent therapy with aspirin is continued for different periods of time, depending on whether or not coronary involvement is identified. Echocardiogram should be performed on admission, and again at 2 weeks. If either study demonstrated coronary abnormalities, followup echos may be necessary.

Aeromedical Implications

Our population (military jet, transport and helicopter pilots, navigators, and aircrew) are exposed to extraor-

dinary stressors which could exacerbate coronary insufficiency or susceptibility to rupture or thrombosis. First, hypoxia may develop at altitude due to the lower barometric pressure. Second, high Gs experienced by jet pilots, Navy flight officers (NFOs), and aircrew would further limit blood flow to an already limited coronary system. Third, operationally during conflict, mission profiles are often modified. Lengthened missions and hostile environments may cause a pilot and his crew to exceed their physical limitations.

As flight surgeons we must evaluate the candidate's ability to perform in his desired position, thinking not only about the implications of the disease or disease process, but also considering the potential risk for progression of the disease, and long-term morbidity from the disease. In times of military cut-backs, our decisions must also take into consideration such factors as cost and length of training, length of service contract for the desired position, cost of the initial workup, and the cost of followup. Combining analysis from all these factors will best help us evaluate each candidate's suitability for the desired position.

Obtaining old hospital records is paramount in determining the candidate's risk for consequences from the disease. Since 15-25 percent of children with the disease develop coronary ectasia or aneurysm, which may lead to myocardial infarction, chronic coronary artery insufficiency or sudden death, it is important to know what treatment the child received during the illness, and whether or not coronary abnormality was noted on echocardiogram.

Data is sparse on long-term prognosis for children with Kawasaki dis-

ease who do not have aneurysms or whose aneurysms have regressed. Individual patient data has suggested that coronary perfusion abnormalities exist, even in patients who have demonstrated normal coronary artery anatomy on angiogram.

Paridon et al used single-photon emission computed tomographic imaging (SPECT) to study myocardial perfusion during exercise. They showed that stress-induced perfusion defects are frequent even in the absence of ST segment changes suggestive of ischemia. The mechanism responsible for any true perfusion defects seen in these patients must presumably be related either to distal stenotic lesions that were missed by echocardiography or perhaps to an abnormal vasodilatory response to exercise.(3)

Reports by Ishiwata et al(4) and Kato et al(5) highlight 5 and 21 patients respectively (all asymptomatic a minimum of 10-20 years), who developed symptoms of ischemic coronary artery disease 10-20 years after a suspected episode of Kawasaki disease.(6) Most of these individuals, age ranges 17-36 and 20-63, sustained myocardial infarction secondary to coronary obstruction.

Evaluation

There are currently no guidelines to assist Navy flight surgeons in the evaluation of a candidate with a history of Kawasaki disease. The following recommendations were adapted from Dajani et al, 1994, *Guidelines for Long-term Management of Patients with Kawasaki Disease*. Obtaining any available medical records is very important. A candidate who demonstrated normal coronary anatomy during the illness, and received IVIG, is at

very low risk for having coronary abnormalities, even the very small distal aneurysms that might not be detected with echo.

Risk Level I

These patients demonstrated no coronary artery involvement at any stage of their illness. They were unlikely to have been restricted from physical activity, and no long-term followup was required. The risk for coronary involvement is low, but whether or not high-G flight would increase the risk for coronary insufficiency is very difficult to determine because of the unknown status of the patient's coronary arteries. An exercise stress test (EST) with sestimibi should be required on initial physical to evaluate coronary perfusion. If normal perfusion is seen, the condition should then be considered disqualifying (CD) for all duty involving flying (DIF) or duty involving actual control of aircraft (DIACA), but be waiverable for all candidates. Making the condition CD mandates annual physical exam which includes an EKG. For all pilots and NFOs, and those selected aircrew likely to sustain high-G flight, EST with sestimibi should be repeated triennially to demonstrate any obvious abnormalities in coronary perfusion. For aircrew flying in non-ejection aircraft, and not likely to sustain high-G flight, the initial EST with sestimibi should be sufficient with annual physical exam which includes an EKG.

Risk Level II

These patients demonstrated transient coronary artery ectasia that disappeared during the acute illness. They are unlikely to have been restricted from physical activity, and had no

long-term followup unless cardiac disease was suspected. Since these individuals did have some coronary abnormality during the acute phase, they are more susceptible to developing sequelae from their disease. Candidates should be considered for EST with sestimibi, for any duty involving flying. Since these patients have already demonstrated some coronary abnormality by echo or catheterization, the possibility for future complications increases. The condition should be CD for all DIF or DIACA, and if EST with sestimibi demonstrates normal perfusion, waiverable for all candidates. Annual exam includes an EKG. Triennial evaluation should include EST with sestimibi.

Risk Level III

These patients demonstrated a solitary small to medium coronary artery aneurysm. If the candidate became ill in the first decade of life, it is likely they were allowed to participate in unrestricted physical activity. If they became ill after the first decade, they were likely restricted in their activity level, and followed by a cardiologist with serial EST. EST with sestimibi would likely show abnormality, but short of cardiac catheterization, there is no way to demonstrate normal coronary anatomy. Since catheterization is very invasive, places the patient in a position of excess risk, and is expensive, it should not be undertaken for determination of DIF. This condition should be CD without waiver for all candidates.

Risk Level IV

These individuals demonstrated one or more giant coronary artery aneurysms, or multiple small to medium aneurysms, without obstruction. These

individuals were treated as those in risk level III in terms of physical activity and followup, except that they have likely had more extensive cardiac followups. These individuals demonstrated diffuse disease, and the risk for coronary insufficiency should preclude DIF. This condition should be CD without waiver for all candidates.

Risk Level V

These individuals have already demonstrated coronary artery obstruction. They have previously been advised to avoid rigorous activity, and have had extensive cardiology followups. As in risk level IV, this condition should be CD without waiver for all candidates.

Risk Level Unknown

These individuals are those from which no medical records could be obtained. It is difficult to determine whether they should even be considered for flying duty, since the risk for some coronary abnormality exists. Moreover, since EST with sestimibi cannot completely rule out coronary abnormalities, the condition may not be able to be evaluated sufficiently without definitive cardiac catheterization. For pilots and NFOs the condition should be CD without waiver. For aircrew candidates, one could consider treating them as a risk level II, and evaluation with EST with sestimibi could be performed. If testing was normal, waiver could be considered with the understanding that risk for coronary involvement still exists. Restricted waiver to non-ejection seat aircraft might be most appropriate in these individuals. Followup would include annual physical with an EKG, and triennial evaluation including an EST with sestimibi V.

Conclusions

Kawasaki disease presents a very complicated scenario for the flight surgeon. Since the disease can affect the coronary arteries in the acute phase of the illness, but not manifest until years later, it is challenging to determine an appropriate protocol for aviation candidates. Long-term followup studies are only now being undertaken, and so data on sequela are sparse. Also, the costs of initial evaluation, long-term followup studies, and training must be figured into our recommendations, so as to limit the number of candidates who cannot complete either their training or payback as a result of their disease. As naval flight surgeons, we are obligated to take a conservative approach to any duty involving flying until more long-term followup data is available.

References

1. Melish M. Clinical and epidemiologic aspects of Kawasaki disease. *Clin Cardiol.* 1991; 14(suppl II):3-10.
2. Newburger J, Takahashi M, Burns J, Beiser A, Chung K, Duffy C, Glode M, Mason W, Reddy V, Sanders S, Shulman S, Wiggins J, Hicks R, Fulton D, Lewis A, Leung D, Colton T, Rosen F, Melish M. The treatment of Kawasaki syndrome with intravenous gamma globulin. *N Eng J Med.* 1986;315:341-347.
3. Paridon S, Galioto F, Vincent J, Tomassoni T, Sullivan N, Bricker J. Exercise capacity and incidence of myocardial perfusion defects after Kawasaki Disease in children and adolescents. *J Am Coll Cardiol.* 1995;6:1420-1424.
4. Ishiwata S, Fuse K, Nishiyama S, Nakanishi S, Watanabe Y, Seki A. Adult coronary artery disease secondary to Kawasaki disease in childhood. *AM J Cardiol.* 1992;69:692-694.
5. Kato H, Inoue O, Kawasaki T, Fujiwara H, Watanabe T, Toshima H. Adult coronary artery disease probably due to childhood Kawasaki disease. *Lancet.* 1992;340:1127-1129.
6. Ross B. Kawasaki disease: unsafe at any age? *J Am Coll Cardiol.* 1995;25:1425-1427.

Dr. Le Hew was previously the senior flight surgeon stationed at Naval Hospital Great Lakes, IL. She is currently assigned to Patrol Squadron Nine.

Book Review

Patterson, Gerard A. *Debris of Battle, the Wounded of Gettysburg*. Stackpole Books, Mechanicsburg, PA, 1997, 244 pages. \$24.95.

Debris of Battle, Gerard Patterson's second book, tells a side of the Civil War seldom discussed, that of treating the 22,000 wounded Union and Confederate soldiers of Gettysburg. It is a tribute to both military and civilian doctors, and the crucial volunteers that spent 5 months after the battle saving lives, burying the dead, and bringing some semblance of normalcy to the chaos created by war.

As The Army of the Potomac followed Robert E. Lee and his defeated army back into Virginia in July 1863, the victors took the bulk of medical support with them, leaving only 30 ambulances and a handful of army doctors and assistants to treat thousands of wounded.

Supplies were short and surgeons ordered houses raided for sheets and linens to make bandages. There are stories of both heroism and cruelty. One tells of Confederate Surgeon Simon Baruch, a Prussian immigrant who created an operating table from a door supported by stumps and chairs.

Then there were the gawkers who toured the battle site, hoping to see a dismembered body or to pick through the pockets of the dead. These erstwhile tourists had no intention of helping the injured.

Despite these gruesome details, the author shows us the other side of the coin—the accounts of heroism and compassion. Angels of mercy like the Sisters of Charity were the first on the scene, doing their best to feed and sustain the wounded of both sides. Lydia Smith, an African-American, spent the last of her money to buy an underfed horse and cart, and then traversed the countryside rummaging about for food and clothing. She then dispensed her supplies freely among the wounded of both blue and gray.

Dorothea Dix, the first Superintendent of Army nurses, insisted that nurses be over 30, dress in black, and not be attractive to be employed in the Army medical services. This policy denied many qualified women who earnestly wanted to help. Miss Dix held enormous power and was given the rank of Major General of Volunteers by the War Department. The

role of women in this carnage can only be described in one word uttered by a military surgeon present at Gettysburg—"invaluable!"

The author highlights the work of the United States Sanitary Commission and its counterpart, the Christian Commission, in saving many lives and providing and channeling thousands of dollars in food and medical supplies to the battlefield. Had these commissions not existed the military medical and logistical corps could not have coped with such devastation.

It was at the train station near Gettysburg, choked with wounded men dying in the hot July sun, that the Sanitary Commission began treating and feeding those in dire need.

The Civil War advanced the progress of military medicine. Medical specimens characterizing wounds and disease were catalogued and studied. Physicians meticulously described their treatment methods and these writings themselves were made available. Simon Baruch, the previously mentioned Confederate surgeon, wrote a paper on the treatment of bayonet wounds that military physicians would use during World War I. Jonathan Letterman, Medical Director of the Army of the Potomac, revolutionized the handling of battle casualties by introducing concepts of self-aid, aid stations, and the setting up and equipping of field hospitals in the rear of the battle zone.

Anyone interested in the evolution of military medicine should read *Debris of Battle*. It offers a rare perspective on the mechanics of treating massive battle casualties and how people act under such singular circumstances. The delivery of health care during the Civil War required the talents, dedication, and teamwork of many individuals from litter-bearers and surgeons to young female volunteers and military logisticians (quartermasters). The story of American military medicine is the story of America.

—LT Youssef H. Aboul-Enein, MSC, USNR, Plans, Operations and Medical Intelligence Officer, Naval Hospital Great Lakes, IL.

Navy Medicine Research and Development Highlights

●DOD Birth Defects Registry

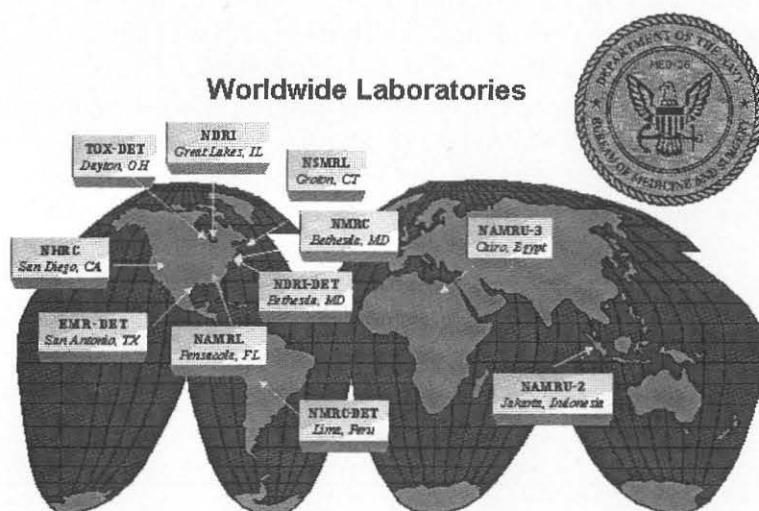
Every day an estimated 250 babies are born to military personnel around the world. DOD Health Affairs tasked the Naval Health Research Center (NHRC), San Diego, CA, to create and maintain a DOD data base to determine the rate of birth defects among DOD health care beneficiaries. Building the DOD birth defects registry requires the review of large amounts of medical data from military families worldwide. In January, the NHRC research team of epidemiological experts started collecting statistics on all children born to active duty and retired personnel, their spouses, and their dependents. For this project, NHRC is developing cutting-edge software strategies using existing data and medical chart review. The registry will include several elements such as a medical diagnostic code, medical care history, birthplace, birth date, and the parent(s) military rank, branch of service, and zip code.

The information in the data base will be used to monitor trends, to make comparisons with other registries, and to conduct epidemiological studies. The information collected will increase the knowledge about the occurrence and distribution of birth defects in the military community. With this information it will be possible to see if birth defects are linked to living in certain places, working in specific jobs, or other factors such as taking specific medications during pregnancy. Statistics generated from this registry will provide timely answers to reproductive questions for health policy decision makers. While it is important to collect this data, it is equally important to maintain individual privacy. In order to preserve patient confidentiality, strict data protection procedures are in place. In addition, a committee comprised of military and civilian representatives has reviewed the ethics of the project. NHRC is a recognized center of epidemiological expertise. Past studies encompass a wide range of subject

areas including complex searches for causes of illness among Gulf War veterans and emerging infectious disease threats.

●Detection of Periodontopathic Bacteria

Navy researchers at the Naval Dental Research Institute, Great Lakes, IL, developed an assay to determine a patient's risk for developing periodontal disease and to monitor the efficacy of periodontal treatment. The assay can be used in the diagnosis and treatment of periodontal disease (positive for certain levels of periodontopathic bacteria) on a whole-mouth basis or at specific sites within the mouth. More specifically, it is an immunodiagnostic assay for rapidly detecting the presence of certain periodontopathic bacteria in dental plaque, saliva, oral rinse, and gingival crevicular fluid samples. The assay uses highly specific monoclonal antibodies to detect periodontopathic bacteria such as *Treponema denticola*, *Treponema socranskii*, *Eikenella corrodens*, *Porphyromonas gingivalis*, and *Campylobacter rectus*. The test is noninvasive, inexpensive, and rapid (5 minutes) and can be performed in or near a dental operator with definitive results obtained while the patient is still in the chair. This makes the test useful for patient education and motivation. The Naval Dental Research Institute conducts a variety of research projects in fleet and field dentistry.



Navy Medicine Seeks Articles

While many quality articles are submitted to *Navy Medicine*, we are constantly looking for greater diversity. Because Navy medicine is a dynamic, changing institution, we would especially like this journal to provide an opportunity for the free exchange of ideas, opinions, and innovations. There is no one topic that assures publication, but here are some general topics we would like to see more of:

Research—cutting edge research of both a professional and clinical nature. We are also interested in research articles geared for the lay reader.

History—historical articles related to Navy medicine.

Unusual experiences—first person accounts of current events, such as natural disasters and deployments. Third person accounts are also encouraged as they generally add a broader perspective. Even if these articles are not published, informative pieces will be entered into the BUMED Archives for research purposes.

Opinion—thought-provoking editorials and opinions on whatever you feel is important: for example, downsizing—how do current military reductions affect Navy medicine; the future—what does the future portend for Navy medicine (fleet support, dependent care, TRICARE, etc.), and the individual corps?

Professional/Clinical articles—when writing professional/clinical articles, remember that the aspect of care or innovative practice should be unique or particularly relevant to Navy medicine, i.e., treatment of tropical diseases which afflict Navy personnel during deployments.

Editorial Guidelines

Text

Submissions of 1,000 to 2,000 words should be double-spaced. Include a 3½-inch disk in one of the following formats: WordPerfect 5.1, WordPerfect 6.1, or MS Word 97. Please be sure to include the full name, rank, and affiliation of the author or authors, a contact telephone number, military address, and email address.

Illustrations

Photos should, whenever possible, be color or black and white 8" x 10", captioned, and with photographer noted for credit purposes. Quality photography is essential. Snapshot photos, Polaroids, or those not properly focused and exposed cannot be used. Exceptional photos related to any aspect of Navy/Marine Corps medical practice are always in demand for cover use. No color slides, large transparencies, or digital images, please.

Tables and figures should be fully marked and camera-ready. References should be properly footnoted, and the manuscript should have a bibliography if outside sources were used. For the proper format, consult a recent copy of *Navy Medicine*.

Contact

Jan K. Herman, Editor
Bureau of Medicine and Surgery (MED-09H)
2300 E Street NW
Washington, DC 20372-5300
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Contest

Navy Medicine in the New Millennium

For 10 years Charlie Golf One pennants have flown from the flagpoles at all our commands and at BUMED signifying our motto—Standing By Ready to Assist.

As we look forward to a new century and reflect upon what has evolved in Navy health care during the last decade—managed care, operations tempo, multi-dimensional missions, reconfiguring commands—the Surgeon General is sponsoring a contest to adopt a new

motto for the Medical Department, a motto that, when translated into signal pennants, will project what Navy medicine stands for at the beginning of the new millennium.

Entries should be submitted electronically in MS Word 97 to jkherman@us.med.navy.mil. The deadline is 16 July 1999.

The Surgeon General will announce the winner at the Surgeon General's Conference, 29 Aug-1 Sept.

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